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EXAMINER				
KOPCHIK, STEPHEN W				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/568,479

Applicant(s)

ECK ET AL.

Examiner

STEPHEN KOPCHIK

Art Unit

4154

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 February 2006.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-13 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 15 February 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☒ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date 7/27/07
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Priority

1. Should applicant desire to obtain the benefit of foreign priority under 35 U.S.C. 119(a)-(d) prior to declaration of an interference, a certified English translation of the foreign application must be submitted in reply to this action. 37 CFR 41.154(b) and 41.202(e).

Failure to provide a certified translation may result in no benefit being accorded for the non-English application.

Drawings

2. The drawings are objected to because FIG.1 contains a lead line with no label. Similarly, the specification refers to "the vascular system 9" but there is no reference numeral 9 on FIG.1. The examiner requests corrections be made to avoid confusion. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the

remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities: The applicant does not clearly enumerate the beginning of each subsection of the specification. The examiner requests correction to avoid any confusion in the future. Please see below for the standards for arrangement and content of the specification.

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.

- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Content of Specification

- (a) Title of the Invention: See 37 CFR 1.72(a) and MPEP § 606. The title of the invention should be placed at the top of the first page of the specification unless the title is provided in an application data sheet. The title of the invention should be brief but technically accurate and descriptive, preferably from two to seven words may not contain more than 500 characters.
- (b) Cross-References to Related Applications: See 37 CFR 1.78 and MPEP § 201.11.
- (c) Statement Regarding Federally Sponsored Research and Development: See MPEP § 310.
- (d) The Names Of The Parties To A Joint Research Agreement: See 37 CFR 1.71(g).
- (e) Incorporation-By-Reference Of Material Submitted On a Compact Disc: The specification is required to include an incorporation-by-reference of electronic documents that are to become part of the permanent United States Patent and Trademark Office records in the file of a patent application. See 37 CFR 1.52(e) and MPEP § 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text were permitted as electronic documents on compact discs beginning on September 8, 2000.
- (f) Background of the Invention: See MPEP § 608.01(c). The specification should set forth the Background of the Invention in two parts:
 - (1) Field of the Invention: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions of the subject

matter of the claimed invention. This item may also be titled "Technical Field."

- (2) Description of the Related Art including information disclosed under 37 CFR 1.97 and 37 CFR 1.98: A description of the related art known to the applicant and including, if applicable, references to specific related art and problems involved in the prior art which are solved by the applicant's invention. This item may also be titled "Background Art."
- (g) Brief Summary of the Invention: See MPEP § 608.01(d). A brief summary or general statement of the invention as set forth in 37 CFR 1.73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.
- (h) Brief Description of the Several Views of the Drawing(s): See MPEP § 608.01(f). A reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74.
- (i) Detailed Description of the Invention: See MPEP § 608.01(g). A description of the preferred embodiment(s) of the invention as required in 37 CFR 1.71. The description should be as short and specific as is necessary to describe the invention adequately and accurately. Where elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.
- (j) Claim or Claims: See 37 CFR 1.75 and MPEP § 608.01(m). The claim or claims must commence on separate sheet or electronic page (37 CFR 1.52(b)(3)). Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation.

There may be plural indentations to further segregate subcombinations or related steps. See 37 CFR 1.75 and MPEP § 608.01(i)-(p).

- (k) Abstract of the Disclosure: See MPEP § 608.01(f). A brief narrative of the disclosure as a whole in a single paragraph of 150 words or less commencing on a separate sheet following the claims. In an international application which has entered the national stage (37 CFR 1.491(b)), the applicant need not submit an abstract commencing on a separate sheet if an abstract was published with the international application under PCT Article 21. The abstract that appears on the cover page of the pamphlet published by the International Bureau (IB) of the World Intellectual Property Organization (WIPO) is the abstract that will be used by the USPTO. See MPEP § 1893.03(e).
- (l) Sequence Listing. See 37 CFR 1.821-1.825 and MPEP §§ 2421-2431. The requirement for a sequence listing applies to all sequences disclosed in a given application, whether the sequences are claimed or not. See MPEP § 2421.02.

Appropriate correction is required.

Claim Objections

4. Claims 1-13 are objected to because of the following informalities: Examiner requests the applicant remove the reference characters from the claims. Examiner has taken the liberty and deleted them when doing analysis below. While the removal of reference characters is not required, the examiner requests that if applicant desires to keep the reference characters, that the applicant check to make sure the reference characters correspond to the elements recited in the detailed description and drawings. Appropriate correction is required.

5. Claims 8 and 10 are objected to because of the following informalities: Claims 8 and 10 use exemplary language. While the use of exemplary language is not a per se violation of 35 U.S.C. 112 2nd paragraph, the examiner is providing notice of the

informality to the applicant. See MPEP §2173.05(d). For the purposes of prosecution, the examiner takes the position that he can establish the metes and bounds of Claims 8 and 10 and will treat the exemplary language as not limiting. However, the examiner does request that applicant delete the exemplary language from the claims to lessen the chance of confusion in the future.

6. Claims 1, 3, 6, 11-13 are objected to because of the following informalities: The above listed claims recite elements using the language "and/or," "preferably," "especially," and "optionally." The examiner requests that applicant correct the above claims to positively establish if the claim is limited by the element so to avoid the claim being indefinite under 35 U.S.C. 112 2nd paragraph. For the purposes of prosecution, the examiner takes the position that he can establish the metes and bounds of the above listed claims and will treat the above language as alternative language and non-limiting. However, the examiner does request that applicant make corrections to the claims to lessen the chance of confusion in the future.

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 1, 12, and 13 are provisionally rejected on the grounds of obviousness-type double-patenting as being unpatentable over Claim 1 of U.S. Patent Application No. 20060257006 A1 (hereafter USPGPUB '7006).

This is a provisional obviousness-type double patenting rejection.

9. Regarding Claim 1 of the present application, Claim 1 of USPGPUB '7006 recites an object located in a path network, a map image of the path network, an estimation of the object position in relation to the map network, combining the map image and the current image based upon the estimated object position related to the map image. Claim 1 of USPGPUB'7006 differs from Claim 1 herein in that it further limits by using segmentation in the processing of the images for registration. However, it would be obvious to one of ordinary skill in the art at the time of the invention that Claim 1 herein could be achieved by the recited elements of USPGPUB '7006, i.e. the broader claim is obvious in light of the narrower claim. Therefore, Claim 1 of USPGPUB '7006 renders Claim 1 herein obvious as one of ordinary skill in the art at the time of invention would be able to achieve the claimed invention with a reasonable expectation of success based on USPGUB '7006.

10. Regarding Claim 12 of the present application, Claim 1 of USPGPUB '7006 recites an object located in a path network, a map image of the path network, an estimation that the map image belongs in the path network, estimation of the position of the object in relation to the map image by a distance image, and superimposing the map image and the current image based upon the estimated object position related to the map image. Claim 1 of USPGPUB'7006 differs from Claim 12 herein in that it further limits by using segmentation in the processing of the images for registration. However, it would be obvious to one of ordinary skill in the art at the time of the invention that Claim 12 herein could be achieved by the recited elements of USPGPUB '7006, i.e. the broader claim is obvious in light of the narrower claim. Therefore, Claim 1 of USPGPUB '7006 renders Claim 11 herein obvious as one of ordinary skill in the art at the time of invention would be able to achieve the claimed invention with a reasonable expectation of success based on USPGUB '7006.

11. Regarding Claim 13, Claim 13 is a method claim corresponding apparatus Claim 1. Therefore, it has been analyzed and rejected with respect to Claim 1.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 1-13 rejected under 35 U.S.C. 102(b) as being anticipated by Packer et al (U.S. Patent No. 6,556,695 B1, hereafter "Packer").

14. Regarding Claim 1, Packer discloses a device for combining a current image of an object (Col.8, Lines 47-50 and Col.9 21-24) and a map image of the dwell region of the object (Col.9, Lines 37-52), containing a data-processing system that is arranged

a) to estimate the position of the object in relation to the map image (Col.9, Lines 59-67 and Col.10, Lines 1-5), and

b) to combine the map image around the estimated position of the object with the current image, the estimated position of the object in the map image being brought into register with the actual position of the object in the current image, and only a section of the map image and/or of the current image being used (Col.10, Lines 31-36).

15. Claims 2-6 and 8-11 depend upon Claim 1, therefore the rejection of Claim 1 is incorporated into the rejections of Claims 2-6 and 8-11 and only further limitations will be addressed below.

16. Regarding Claim 2, Packer discloses a device as claimed in claim 1, characterized in that the object is located in a path network and the map image at least partially reproduces the path network (Col.8, Lines 47-50 and Col.9, Lines 42-44; taking the broadest reasonable interpretation of the claim language, the examiner interprets "path network" to include a vascular system, which the prior art discloses the use of a

flexible catheter in a vascular system and corresponding stored images of the vascular system).

17. Regarding Claim 3, Packer discloses a device as claimed in claim 1, characterized in that the map image contains additional information about the structures and/or functions of the dwell region of the object (Col.9, Lines 42-44; the prior art discloses stored images of the vascular system at successive positions during the cardiac cycle, it is inherent that each of these positions would contain additional information, beyond just a mapping, about the structures and/or functions of the vascular system at the specific heart cycle that make it different from the other cycles).

18. Regarding Claim 4, Packer discloses a device as claimed in claim 1, characterized in that it contains a monitor for displaying the combination of the current image and the section of the map image (Col.10, Lines 31-36 and Lines 48-53).

19. Regarding Claim 5, Packer discloses a device as claimed in claim 1, characterized in that it has a memory for storing a number of map images, which are being categorized according to a varying state of the dwell region of the object (Col.9, Lines 42-52).

20. Regarding Claim 6, Packer discloses a device as claimed in claim 1, characterized in that it has a sensor device for detecting at least one parameter that

describes a varying state of the dwell region of the object, preferably for detecting an electrocardiogram and/or the respiratory cycle (Col.9, Lines 5-23).

21. Claim 7 depends upon Claim 5, therefore the rejection of Claim 5 is incorporated into the rejection of Claim 7 and only further limitations will be addressed below.

22. Regarding Claim 7, a device as claimed in claim 5, characterized in that the data-processing system is arranged to select from the memory a map image whose associated state of the dwell region of the object is a best possible match for the state of the dwell region during the current image (Col.9, Lines 59-67 and Col.10, Lines 1-5).

23. Regarding Claim 8, Packer discloses a device as claimed in claim 1, characterized in that the data-processing system is arranged to assign in the map image to each pixel a probability that it belongs to a spatially-defined structure, such as a path network for example (Col.9, Lines 59-67 and Col.10, Lines 1-5).

24. Regarding Claim 9, Packer discloses a device as claimed in claim 1, characterized in that the data-processing system is arranged to produce a distance image from the map image by a distance transformation (Col.9, Lines 53-67 and Col.10, Lines 1-8; taking the broadest reasonable interpretation of the above claim, the distance image can be interpreted as being a type of function that outputs the likelihood of registration between the map image and the object image. Further, the applicants own

specification suggests the distance image is only used for estimating the position of the object in relation to the map image and is never displayed (Page 6, Lines 21-23). This suggests the distance image does not have to be an actual 'image' but only an estimation tool. Therefore, the prior art anticipates the distance image as claimed herein by calculating a cost function in matching the stored map image to the object image when registering).

25. Regarding Claim 10, Packer discloses a device as claimed in claim 1, characterized in that, in the section, points not belonging to a spatially-defined structure, such as a path network for example, are transparent (Col.10, Lines 48-67 and Col.11, Lines 1-13; The prior art discloses different embodiments on how the display is viewed by the physician, including being able to focus on a specific region of the anatomy, therefore it is inherent that the display device in the prior art would allow non-matching points to be transparent in order to better view the targeted portion).

26. Regarding Claim 11, Packer discloses a device as claimed in claim 1, characterized in that it has an imaging means, especially an X-ray apparatus and/or an NMR apparatus, for producing the current image and optionally the map image (Col.10, Lines 31-36 and 48-52).

27. Regarding Claim 12, Packer discloses a device for combined portrayal of a current image of an object that is located in a path network (Col.8, Lines 47-50 and

Col.9 21-24) and a map image of the path network (Col.9, Lines 37-52) containing a data-processing system that is arranged

a) in the map image to assign to each pixel a probability that it belongs to the path network (Col.9, Lines 59-67 and Col.10, Lines 1-5);

b) to produce a distance image from the map image by a distance transformation (Col.9, Lines 53-67 and Col.10, Lines 1-8; taking the broadest reasonable interpretation of the above claim, the distance image can be interpreted as being a type of function that outputs the likelihood of registration between the map image and the object image. Further, the applicants own specification suggests the distance image is only used for estimating the position of the object in relation to the map image and is never displayed (Page 6, Lines 21-23). This suggests the distance image does not have to be an actual 'image' but only an estimation tool. Therefore, the prior art anticipates the distance image as claimed herein by calculating a cost function in matching the stored map image to the object image when registering).

c) by means of the distance image to estimate the position of the object in relation to the map image of the path network (Col.9, Lines 53-67 and Col.10, Lines 1-8), and

d) to superimpose the map image wholly or in sections on the current image or a section thereof so that the estimated position of the object in the map image is brought into register with the actual position of the object in the current image (Col.10, Lines 31-36).

28. Regarding Claim 13, Claim 13 is a method claim corresponding to apparatus Claim 1, therefore Claim 13 has been analyzed and rejected with respect to Claim 1.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEPHEN KOPCHIK whose telephone number is (571)270-7117. The examiner can normally be reached on Monday-Thursday 9:30 AM - 6 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vu Le can be reached on (571) 272-7332. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/STEPHEN KOPCHIK/
Examiner, Art Unit 4154

/Vu Le/
Supervisory Patent Examiner, Art Unit 4154